AMENDMENTS

The following is a complete listing of the claims that replaces all previous versions.

1. (Currently amended) A method for conducting a chemical reaction in a non-fluorous medium using at least one chemical reactant and a fluorous compound in the presence of a solid adsorbant containing a fluorous domain, the method comprising:

contacting the fluorous compound and the at least one chemical reactant in the non-fluorous medium and in the presence of the solid adsorbant under conditions that form at least one product; and

changing at least one reaction condition such that the solubility of the fluorous compound in the non-fluorous medium decreases and the amount of the fluorous compound absorbed on the fluorous domain of the solid adsorbant increases,

wherein the changing at least one reaction condition is selected from the group consisting of adjusting a temperature, adjusting a solvent concentration, adding an additive, and combinations thereof, and

wherein the fluorous compound comprises at least one fluorous moiety having a formula $-(R)_n(Rf)_m$, where R is independently, the same or different, a hydrocarbon moiety, Rf is independently, the same or different, a fluorous domain, n is an integer equal to at least 0, and m is an integer greater than 0, and

wherein the chemical reaction is conducted in the absence of a fluorous solvent, and wherein the at least one product is a different chemical compound than the at least one chemical reactant and the fluorous compound.

2. (Original) The method of claim 1, wherein the fluorous compound is transformed into at least one fluorous product.

3. (Original) The method of claim 1, wherein the at least one chemical reactant is transformed into at least one chemical product.

4. (Previously presented) The method of claim 1, wherein the fluorous compound is a fluorous reagent or a fluorous catalyst.

5. (Canceled)

6. (Original) The method of claim 1, wherein the non-fluorous medium further comprises a solvent selected from the group consisting of an organic solvent, an inorganic solvent and mixtures thereof.

7. (Original) The method of claim 1, wherein the solid adsorbant containing the fluorous domain is selected from the group consisting of polytetrafluoroethylene, perfluorinated polymers, highly fluorinated polymers, non-fluorous polymers into which fluorous domains have been incorporated, biomaterials into which fluorous domains have been incorporated, inorganic oxides onto which fluorous domains have been introduced, solid polymeric materials onto which fluorous domains have been introduced, extended domain materials onto which fluorous domains have been introduced, non-polymeric materials containing fluorous domains, oligomeric materials containing fluorous domains, and mixtures thereof.

8. (Original) The method of claim 1, wherein the solid adsorbant containing the fluorous domain is in a form selected from the group consisting of pellets, shavings, powders, amorphous solids, gels, a coating, and mixtures thereof.

9. (Canceled)

10. (Previously presented) The method of claim 1, wherein adjusting the temperature comprises reducing the temperature, and adjusting the solvent concentration is selected from the group consisting of adding at least one organic solvent, adding at least one inorganic solvent, removing an organic solvent, and removing an inorganic solvent.

11. (Previously presented) The method of claim 1, wherein the changing at least one reaction condition comprises reducing the temperature of the chemical reaction from a first temperature to a second temperature such that the solubility of the fluorous compound in

the non-fluorous medium decreases and the amount of the fluorous compound absorbed on the fluorous domain of the solid adsorbant increases.

12. (Previously presented) The method of claim 1, wherein the solubility of the fluorous compound in the non-fluorous medium after changing the at least one reaction condition is less than 0.01 M.

13. (Previously presented) The method of claim 1, the method further comprising separating the solid adsorbant containing the fluorous domain with the absorbed fluorous compound from the at least one chemical product.

14. (Original) The method of claim 13, wherein the solid adsorbant containing the fluorous domain with the absorbed fluorous compound is separated from the at least one chemical product using a separation technique selected from the group consisting of decantation, filtration, and centrifugation.

15. (Original) The method of claim 13, wherein the fluorous compound is a fluorous catalyst, the method further comprising submitting the solid adsorbant containing the fluorous domain with the absorbed fluorous compound to a second chemical reaction.

16. (Original) The method of claim 13, wherein the fluorous compound is a fluorous reagent, the method further comprising regenerating the fluorous reagent and submitting the regenerated fluorous reagent to a second chemical reaction.

17. (Original) The method of claim 1, wherein the fluorous compound has a general formula:

$D[(R)_n(Rf)_m]_y$,

wherein D has a structure selected from the group consisting of an organic group, P, OH, OR, N, S, As, and Si, R is independently, the same or different, a hydrocarbon moiety, Rf is independently, the same or different, a fluorous moiety, n is an integer equal to at least

0, m is an integer greater than 0, and y is an integer between 1 and the maximum number of bonding attachments of D.

18. (Original) The method of claim 17, wherein D is phosphorous, R is $-CH_2-$, n is an integer from 2 to 5, m is equal to 1, and y is equal to 3.

19. (Original) The method of claim 17, wherein the fluorous compound has a formula $P((CH_2)_2(CF_2)_7CF_3)_3$.

20. (Original) The method of claim 1, wherein the fluorous compound has a general formula:

$$M_x\{L[(R)_n(Rf)_m]_y\}_z \quad ,$$

wherein M is a metal selected from the group consisting of a transition metal, a lanthanide metal, thorium and uranium, L is a ligand core having a structure selected from the group consisting of C, N, O, P, As, S and Si, R is independently, the same or different, a hydrocarbon moiety, Rf is independently, the same or different, a fluorous moiety, n is an integer equal to at least 0, m is an integer greater than 0, y is an integer between 1 and the maximum number of bonding attachments of L, z is an integer between 1 and the maximum number of ligands attachable to M, and x is an integer from 1 to 4.

21. (Original) The method of claim 20, wherein the fluorous compound has a formula $ClRh[P(CH_2CH_2(CF_2)_5CF_3)_3]_3$.

22. (Currently amended) A method for conducting a chemical reaction in a non-fluorous medium using at least one chemical reactant and a fluorous compound in the presence of a solid adsorbant containing a fluorous domain, wherein the fluorous compound is initially absorbed on the fluorous domain of the solid adsorbant, the method comprising:

changing a first reaction condition from a first state to a second state, such that the solubility of the fluorous compound in the non-fluorous medium increases and the amount

of the fluorous compound absorbed on the fluorous domain of the solid adsorbant decreases; and

contacting the fluorous compound and at the least one chemical reactant in the non-fluorous medium and in the presence of the solid adsorbant under conditions that form at least one product,

wherein the changing the first reaction condition is selected from the group consisting of increasing temperature, adding a co-solvent, adding an additive, and combinations thereof, and

wherein the fluorous compound comprises at least one fluorous moiety having a formula $-(R)_n(Rf)_m$, where R is independently, the same or different, a hydrocarbon moiety, Rf is independently, the same or different, a fluorous domain, n is an integer equal to at least 0, and m is an integer greater than 0, and

wherein the chemical reaction is conducted in the absence of a fluorous solvent, and wherein the at least one product is a different chemical compound than the at least one chemical reactant and the fluorous compound.

23. (Original) The method of claim 22, wherein the fluorous compound is transformed into at least one fluorous product.

24. (Original) The method of claim 22, wherein the chemical reactant is transformed into at least one chemical product.

25. (Previously presented) The method of claim 22, wherein the fluorous compound is a fluorous reagent or a fluorous catalyst.

26. (Canceled)

27. (Original) The method of claim 22, wherein the non-fluorous medium further comprises a solvent selected from the group consisting of an organic solvent, an inorganic solvent and mixtures thereof.

28. (Canceled)

29. (Previously presented) The method of claim 22, wherein the changing the first reaction condition comprises raising the temperature of the chemical reaction from a first temperature to a second temperature, such that the solubility of the fluorous compound in the non-fluorous medium increases and the amount of the fluorous compound absorbed on the fluorous domain of the solid adsorbant decreases.

30. (Original) The method of claim 29, wherein the solubility of the fluorous compound in the non-fluorous medium at the first temperature is less than 0.01 M.

31. (Previously presented) The method of claim 22, the method further comprising changing a second reaction condition from the second state to a third state, such that the solubility of the fluorous compound in the non-fluorous medium decreases and the amount of the fluorous compound absorbed on the fluorous domain of the solid adsorbant increases,

wherein the changing at least one reaction condition is selected from the group consisting of adjusting the temperature, adjusting a solvent concentration, adding an additive, and combinations thereof.

32. (Previously presented) The method of claim 31, wherein changing the second reaction condition comprises reducing the temperature of the chemical reaction from the second temperature to a third temperature, such that the solubility of the fluorous compound in the non-fluorous medium decreases and the amount of the fluorous compound absorbed on the fluorous domain of the solid adsorbant increases.

33. (Original) The method of claim 32, wherein the solubility of the fluorous compound in the non-fluorous medium at the third temperature is less than 0.01 M.

34. (Original) The method of claim 22, wherein the solid adsorbant containing the fluorous domain is selected from the group consisting of polytetrafluoroethylene,

perfluorinated polymers, highly fluorinated polymers, non-fluorous polymers into which fluorous domains have been incorporated, biomaterials into which fluorous domains have been incorporated, inorganic oxides onto which fluorous domains have been introduced, solid polymeric materials onto which fluorous domains have been introduced, extended domain materials onto which fluorous domains have been introduced, non-polymeric materials containing fluorous domains, oligomeric materials containing fluorous domains and mixtures thereof.

35. (Previously presented) The method of claim 22, wherein the solid adsorbant containing the fluorous domain is in a form selected from the group consisting of pellets, shavings, powders, amorphous solids, gels, a coating, and mixtures thereof.

36. (Previously presented) The method of claim 31, the method further comprising separating the solid adsorbant containing the fluorous domain with the absorbed fluorous compound from the at least one chemical product.

37. (Original) The method of claim 36, wherein the solid adsorbant containing the fluorous domain with the absorbed fluorous compound is separated from the at least one chemical product using a separation technique selected from the group consisting of decantation, filtration, and centrifugation.

38. (Original) The method of claim 36, wherein the fluorous compound is a fluorous catalyst, the method further comprising submitting the solid adsorbant containing the fluorous domain with the absorbed fluorous compound to a second chemical reaction.

39. (Original) The method of claim 36, wherein the fluorous compound is a fluorous reagent, the method further comprising regenerating the fluorous reagent and submitting the regenerated fluorous reagent to a second chemical reaction.

40. (Original) The method of claim 22, wherein the fluorous compound has a general formula:

$D[(R)_n(Rf)_m]_y$,

wherein D has a structure selected from the group consisting of an organic group, P, OH, OR, N, S, As, and Si, R is independently, the same or different, a hydrocarbon moiety, Rf is independently, the same or different, a fluorous moiety, n is an integer equal to at least 0, m is an integer greater than 0, and y is an integer between 1 and the maximum number of bonding attachments of D.

41. (Original) The method of claim 40, wherein D is phosphorous, R is $-CH_2-$, n is an integer from 2 to 5, m is equal to 1, and y is equal to 3.

42. (Original) The method of claim 40, wherein the fluorous compound has a formula $P((CH_2)_2(CF_2)_7CF_3)_3$.

43. (Original) The method of claim 22, wherein the fluorous compound has a general formula:

$M_x\{L[(R)_n(Rf)_m]_y\}_z$,

wherein M is a metal selected from the group consisting of a transition metal, a lanthanide metal, thorium and uranium, L is a ligand core having a structure selected from the group consisting of C, N, O, P, As, S and Si, R is independently, the same or different, a hydrocarbon moiety, Rf is independently, the same or different, a fluorous moiety, n is an integer equal to at least 0, m is an integer greater than 0, y is an integer between 1 and the maximum number of bonding attachments of L, z is an integer between 1 and the maximum number of ligands attachable to M, and x is an integer from 1 to 4.

44. (Original) The method of claim 43, wherein the fluorous compound has a formula $ClRh[P(CH_2CH_2(CF_2)_5CF_3)_3]_3$.

45. (Currently amended) A method for conducting a chemical reaction in a non-fluorous medium using a fluorous compound and at least one chemical reactant, the method comprising:

contacting the fluorous compound and at least one chemical reactant in the non-fluorous medium under conditions that form at least one product;

adding solid adsorbant containing a fluorous domain; and

reducing the temperature of the chemical reaction from a first temperature to a second temperature such that the solubility of the fluorous compound in the non-fluorous medium decreases and the amount of the fluorous compound absorbed on the fluorous domain of the solid adsorbant increases,

wherein the fluorous compound comprises at least one fluorous moiety having a formula $-(R)_n(Rf)_m$, where R is independently, the same or different, a hydrocarbon moiety, Rf is independently, the same or different, a fluorous domain, n is an integer equal to at least 0, and m is an integer greater than 0, and

wherein the chemical reaction is conducted in the absence of a fluorous solvent, and wherein the at least one product is a different chemical compound than the at least one chemical reactant and the fluorous compound.

46. (Original) The method of claim 45, wherein the fluorous compound is transformed into at least one fluorous product.

47. (Original) The method of claim 45, wherein the chemical reactant is transformed into at least one chemical product.

48. (Original) The method of claim 45, wherein the fluorous compound is a fluorous reagent.

49. (Original) The method of claim 45, wherein the fluorous compound is a fluorous catalyst.

50. (Original) The method of claim 45, wherein the non-fluorous medium further comprises a solvent selected from the group consisting of an organic solvent, an inorganic solvent and mixtures thereof.

51. (Original) The method of claim 45, wherein the solubility of the fluorous compound in the non-fluorous medium at the second temperature is less than 0.01 M.

52. (Original) The method of claim 45, wherein the solid adsorbant containing the fluorous domain is selected from the group consisting of polytetrafluoroethylene, perfluorinated polymers, highly fluorinated polymers, non-fluorous polymers into which fluorous domains have been incorporated, biomaterials into which fluorous domains have been incorporated, inorganic oxides onto which fluorous domains have been introduced, solid polymeric materials onto which fluorous domains have been introduced, extended domain materials onto which fluorous domains have been introduced, non-polymeric materials containing fluorous domains, oligomeric materials containing fluorous domains and mixtures thereof.

53. (Original) The method of claim 45, wherein the solid adsorbant containing the fluorous domain is in a form selected from the group consisting of pellets, shavings, powders amorphous solids, gels, a coating, and mixtures thereof.

54. (Original) The method of claim 45, the method further comprising separating the solid adsorbant containing the fluorous domain with the absorbed fluorous compound from the at least one chemical product.

55. (Original) The method of claim 54, wherein the solid adsorbant containing the fluorous domain with the absorbed fluorous compound is separated from the at least one chemical product using a separation technique selected from the group consisting of decantation, filtration, and centrifugation.

56. (Original) The method of claim 54, wherein the fluorous compound is a fluorous catalyst, the method further comprising submitting the solid adsorbant containing the fluorous domain with the absorbed fluorous compound to a second chemical reaction.

57. (Original) The method of claim 54, wherein the fluorous compound is a fluorous reagent, the method further comprising regenerating the fluorous reagent and submitting the regenerated fluorous reagent to a second chemical reaction.

58. (Currently amended) A method for conducting a chemical reaction using at least one chemical reactant and a fluorous compound in a non-fluorous medium, in the presence of a solid adsorbant containing a fluorous domain, wherein the fluorous compound is initially absorbed on the fluorous domain of the solid adsorbant, the method comprising:

increasing the temperature of the chemical reaction from a first temperature to a second temperature, such that the solubility of the fluorous compound in the non- fluorous medium increases and the amount of the fluorous compound absorbed on the fluorous domain of the solid adsorbant decreases;

contacting the fluorous compound and at least one chemical reactant in the non-fluorous medium under conditions that form at least one product; and

decreasing the temperature from the second temperature to a third temperature, such that the solubility of the fluorous compound in the non-fluorous medium decreases and the amount of the fluorous compound absorbed on the fluorous domain of the solid adsorbant increases,

wherein the fluorous compound comprises at least one fluorous moiety having a formula $-(R)_n(Rf)_m$, where R is independently, the same or different, a hydrocarbon moiety, Rf is independently, the same or different, a fluorous domain, n is an integer equal to at least 0, and m is an integer greater than 0, and

wherein the chemical reaction is conducted in the absence of a fluorous solvent, and wherein the at least one product is a different chemical compound than the at least one chemical reactant and the fluorous compound.

59. (Original) The method of claim 58, wherein the non-fluorous medium is selected from the group consisting of an organic solvent, an inorganic solvent, and mixtures thereof.

60. (Original) The method of claim 58, wherein the fluorous compound is transformed into at least one fluorous product.

61. (Original) The method of claim 58, wherein the chemical reactant is transformed into at least one chemical product.

62. (Original) The method of claim 58, wherein the fluorous compound is a fluorous reagent.

63. (Original) The method of claim 58, wherein the fluorous compound is a fluorous catalyst.

64. (Original) The method of claim 58, wherein the solubilities of the fluorous compound in the non-fluorous solvent at the first temperature and the third temperature are each less than 0.01 M.

65. (Original) The method of claim 58, wherein the solid adsorbant containing the fluorous domain is selected from the group consisting of polytetrafluoroethylene, perfluorinated polymers, highly fluorinated polymers, non-fluorous polymers into which fluorous domains have been incorporated, biomaterials into which fluorous domains have been incorporated, inorganic oxides onto which fluorous domains have been introduced, solid polymeric materials onto which fluorous domains have been introduced, extended domain materials onto which fluorous domains have been introduced, non-polymeric materials containing fluorous domains, oligomeric materials containing fluorous domains and mixtures thereof.

66. (Original) The method of claim 58, wherein the solid adsorbant containing the fluorous domain is in a form selected from the group consisting of pellets, shavings, powders, amorphous solids, gels, a coating, and mixtures thereof.

67. (Original) The method of claim 58, the method further comprising separating the solid adsorbant containing the fluorous domain with the absorbed fluorous compound from the at least one chemical product.

68. (Original) The method of claim 67, wherein the solid adsorbant containing the fluorous domain with the absorbed fluorous compound is separated from the at least one chemical product using a separation technique selected from the group consisting of decantation, filtration, and centrifugation.

69. (Original) The method of claim 67, wherein the fluorous compound is a fluorous catalyst, the method further comprising submitting the solid adsorbant containing the fluorous domain with the absorbed fluorous compound to a second chemical reaction.

70. (Original) The method of claim 67, wherein the fluorous compound is a fluorous reagent, the method further comprising regenerating the fluorous reagent and submitting the regenerated fluorous reagent to a second chemical reaction.

71. (Previously presented) The method of claim 1, wherein the chemical reaction is conducted in the absence of pressurized carbon dioxide.

72. (Previously presented) The method of claim 45, wherein the chemical reaction is conducted in the absence of pressurized carbon dioxide.